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**The PLUTO**

**“Please Let Us Take Off” Project**

# and COLA

**(Cooperative Learning and Assessment)**

**A Teaching Strategy:**

**Background for use with the PLUTO Project**



Directors:

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| Paul Lowe | Simon Taylor |
| 078895674 H  078897745 S  0277101224  skype: jpaullowe  E mail: problit@xtra.co.nz  <http://web.me.com/jpaullowe> | Secondary Science Advisor; University of Waikato  075775314  0277101224  E mail: simont@waikato.ac.nz |

## Background

COLA will be used extensively during the PLUTO project; the following material gives some background on protocols for team establishment, some strategies to help the team make good progress. We will refer top the ‘groups’ as ‘teams’ during the PLUTO Project.

## Outline

The COLA approach is designed to improve student attitudes and learning outcomes. It is easy to implement in the secondary school classroom and should have no impact on teacher workload or curriculum content. This is achieved through the students doing the bulk of their class work and assessment in cooperative groups with the common goals of increased enjoyment, improved understanding, greater confidence and improved grades. It has been trailed at a number of schools with a great success in both student attitudes and their learning outcomes. The full PhD can be accessed at <http://adt.curtin.edu.au/theses/available/adt-WCU20041112.102310/> .

## Aims and Objectives

## *Aims*

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|  | Minimising the impact of perceived difficult aspects of education by making the students feel more secure during classwork and the often-traumatic assessment procedures carried out in many New Zealand schools. |
|  | Encouraging students to work cooperatively towards achieving a common goal, whether the goal is an assignment or an assessed exercise. |
|  | Encouraging students to enjoy their education and take more responsibility for their own development |

## Protocol for Group Establishment and Organisation

Teachers will use the following guidelines in the setting up and operation of the groups within their classrooms. There will be plenty of opportunity to use any of the cooperative learning ideas from researchers such as the Johnsons and Kagan that have been used in this school. It is most important to ensure that these are kept simple and a have minimal impact on the individual teacher’s workload.

Following the guidelines are a number of suggestions, which have been found to help the group enjoy working together more effectively, and gain more rewards both individually and as a learning team.

It is envisaged that the students will do the majority of their assessments in their groups but the end of year examination will be taken as individuals. If a mid-year test as individuals is wanted then the individual student marks in each group could be averaged to gain a group mark for league table purposes.

Student Instructions

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| 1 | Students are able to select their own group of preferably three but no more. |
| 2 | They are to do all practical, fieldwork, assignments and tests working in these groups. |
| 3 | Each member of the group receives the same mark for tests, assignments, fieldwork and for any other assessment. |
| 4 | All work and assessment is essentially cooperative, students are encouraged to share the workload and enjoy working together, whether it is an assessed activity or a simple practical exercise. |
| 5 | Students will be instructed in suitable ways of ensuring that all group members participate and have a sense of ownership of the results. For example, tasks such as collecting and using equipment are always rotated to make sure that everyone has a turn. |
| 7 | Students are instructed to ensure that each group member is given a specific task and that they are responsible for completing that task on time. The group then collates all of the contributions from each group member (this is often one member’s task). The master assignment is marked and each member receives the same mark along with a copy of the final assignment |
| 8 | For written tests, students are arranged in their groups at the desks to allow them to work together with a minimum of contact with other groups. Eye contact should be possible among group members. Talk within the group is permissible but talk between groups is not. Answers are to be handed in and marked. All group members receive the same grade. |

*Teacher Instructions*

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| 1 | There is essentially no change to the Curriculum content of the students’ course of study. |
| 2 | It may be possible to include a few more strategies that are more suited to the cooperative group work approach such as investigations (both written and practical) and problem solving activities linked to the current topic. |
| 3 | Some groups would need more help in establishing good working relationships than others and teachers would need to try and ensure that all groups operate well. This is made easier by the fact that the whole group gets the tangible reward of grades in any assessment that they do together. Some group restructuring may be necessary if problems appear insurmountable, although such restructuring should be rare. |
| 4 | During written tests opportunity exists to help all groups with their approach to problems encountered during tests. This is not possible with a full class of students sitting tests as individuals. It is a good idea to treat the early tests, in particular, as a formative process and not just summative. One of the main thrusts of the research is to improve student attitudes towards science and helping them with problem solving activities under test conditions is a good vehicle to help achieve this. |
| 5 | During written assignments and practical work students may need help in assigning tasks to each group member. It is important that these tasks are rotated throughout the group where possible to ensure a fair sharing of workload and a sense of worth among the group members. |

### League Tables and Group Names

The students certainly enjoy naming their group or learning team and come up with some imaginative titles. A natural extension of this is the introduction of ‘league tables’ where each groups place is listed on a chart in rank order. The groups are given a mark according to their place in each event (any task that is marked) such as 10 for first and 1 for last. The teacher can set up tasks such as a practical activity and the first group with the correct response(s) provided to the teacher receives the top mark and so on. If there is a range of tasks, every group will have an opportunity for their moment of glory. Students enjoy this aspect of their group work and even the lower ranked students enjoy the chances they get. They are working together to achieve more but not on their own. An example of a league table is available if required.

### Review Testing

After students have completed a test, going over of the answers is often seen as a waste of time by students yet teachers know that reviewing where you have gone wrong in a test is very important as we learn from our mistakes. One of the strategies introduced to help this and build the teamwork is the review test.

Groups are returned their test scripts with their marks including those questions to which they have incorrect responses. They can then be given class time to do the questions that were wrong (open book perhaps or home work). These are resubmitted and remarked. The group then is given an average of the first and second marks.

This strategy has been very successful and students enjoy having the opportunity to increase their group mark. The increased cooperation and opportunity to learn more as they try for more marks has proved to be worthwhile. The teacher does have to re-mark the tests but it is reduced the second time and since there are only 9 or 10 scripts in a class this is still less onerous than tests taken by individuals.

### Unit Review and Student Test Design

Teaching students how to revise for tests is an aspect of teaching often not given the priority it deserves and working on this in teams enables the students to talk among themselves and establish what in fact the key points are in a particular unit. They can use resources such as their notes, texts, prescribed SLO’s and of course the teacher. A unit summary can be presented for the group to use. Student designed tests are also an effective way to help understanding of important parts of a unit. One way of doing this is to give each group part of a topic on which to make up a question (the time and mark value needs to be prescribed by the teacher). The questions from each group are then collated and the test taken in groups. The natural extension of this is for each group to mark the scripts from the rest of the class for their question and then collate the final result.

### Concept Cartoons

The use of argumentation in science through concept cartoons has proved to a valuable tool for use in cooperative group work and has been a regular part of science programmes for some time. Some excellent discussions among group members have led to a better understanding of concepts which students often find more difficult. Examples of concept cartoons are available if required.

Web site; <http://www.angelsolutions.co.nz/products/concept-cartoons.htm> o

[info@angelsolutions.co.nz](mailto:info@angelsolutions.co.nz)

### PROBLIT: Problem based Learning in Teams succeeded COLA 2006

Problem-based learning (PBL) in cooperative groups has been implemented with success. The students are given a problem or scenario that they are required to solve in their groups. In order to solve this, they need to study various aspects of the unit being studied. Resources are provided along with the teacher to help them achieve this. It is important however, to ensure that any more difficult aspects of a particular problem are fully explained to the students, sometimes in their groups but at times there may need to be ‘keystone lectures’ given to the entire class. The students have found this a really enjoyable way of learning the unit and they have produced excellent notes and resources, which can then be used as a reference later in the year. In Science, units such as the human body studied in the context of their favourite sports team have proved very successful. Problem-based learning in groups is a powerful means of giving students more ownership and enjoyment from discovering for themselves key aspects of a unit. PBL can be IT-rich and lends itself to the students presenting their group findings in a variety of ways such as ‘Power Point’. The recent Tsunami disaster certainly lends itself to many possible problems in all subjects. Examples of problem-based units are available if required.

PROBLIT can be found at: <http://web.me.com/jpaullowe> or <http://gallery.me.com/jpaullowe>

PROBLIT full report: <http://www.efellows.org.nz/?q=report_blog/16>

*Practical Organisation: Rotation of jobs*

Students are give a role for each practical activity, the role and job description are summarised in the table below.

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| Job | Description |
| Equipment Manager  Technician  Recorder | Collect and returns appropriate equipment  Does the experiment  Records the results |

Note: If there are only 2 in the team or one member is away the Equipment Manager and Recorder is combined into one job (role).